CLAIMS

What is claimed is:

1. A method of supplying supplemental power from a supplemental power source in addition to that from a primary power source in order to meet power demand of a load, the method comprising the steps of:

setting a set point for power received from the primary power source;

establishing a variable gain for the supplemental power source; and

employing the variable gain, periodically adjusting power supplied by the supplemental power source based on deviations between power actually received from the primary power source and the set point.

2. The method of claim 1 wherein the establishing step comprises establishing a variable gain that is higher for negative deviations between power actually received from the power source and the set point than for positive deviations.

3. The method of claim 1 wherein the employing step comprises adjusting via a variable gain reset - hold integrator.

4. The method of claim 1 wherein the employing step comprises measuring power actually received from the primary power source via a digital meter.

5. The method of claim 4 wherein in the measuring step the digital meter communicates readings to a supervisory control and data acquisition system.

6. The method of claim 5 additionally comprising the step of permitting control personnel to change the set point and variable gain by command to the supervisory control and data acquisition system via a World Wide Web browser interface.

7. The method of claim 1 wherein the supplemental power source comprises a turbine generator.

8. The method of claim 1 wherein the method results in load transients being absorbed by the primary power source rather than the supplemental power source.

9. The method of claim 1 wherein in the employing step a size of the power adjustment in each period is based on the product of the variable gain and a size of the deviation between power actually received from the primary power source and the set point.

10. The method of claim 1 wherein the employing step is invoked only when deviations between power actually received from the primary power source and the set point are outside a tolerance band.

11. The method of claim 10 wherein the tolerance band is established at least in part based on operating limitations of the microturbine.

12. The method of claim 10 wherein the tolerance band is established at least in part based on a desired insensitivity to small changes in the load.

13. The method of claim 1 additionally comprising the step of automatically resetting the set point to zero based on a turbine status bit related to an operating condition of the turbine, wherein the operating condition is chosen from the group that includes turbine speed, turbine inlet temperature, turbine exhaust temperature, fuel flow, and power output.

14. In a system employing a primary flow source and a supplemental flow source to satisfy a demand, wherein the supplemental flow source supplies flow to meet at least a portion of the demand, a method of maintaining a fixed flow offset between the primary flow source and the supplemental flow source, the method comprising the steps of:

(a) creating an actual primary flow source measurement by measuring flow from the primary flow source to the demand;

(b) developing an error signal by establishing a difference between the fixed flow offset from the actual primary flow source flow measurement;

(c) establishing a gain;

(d) creating an input by multiplying the error signal by the gain;

(e) establishing a predetermined tolerance range;

(f) creating a supplemental flow source flow adjustment command based upon the input; and

(g) adjusting the flow output of the supplemental flow source based on the supplemental flow source flow adjustment command, thereby driving the error signal to within the predetermined tolerance range.

15. The method of claim 14 wherein the step of establishing a gain comprises establishing a variable gain.

16. The method of claim 14 wherein the step of creating a supplemental flow source flow adjustment command comprises integrating the input.

17. In a system employing a primary power source and a supplemental power source to satisfy a power load, wherein the supplemental power source supplies power to meet at least a portion of the power load, a method of maintaining a fixed power offset between the primary power source and the supplemental power source, the method comprising the steps of:

(a) creating an actual primary power source measurement by measuring power flow from the primary power source to the power load;

(b) developing an error signal by subtracting the fixed power offset from the actual primary power source power measurement;

(c) establishing a gain;

(d) creating an input by multiplying the error signal by the gain;

(e) establishing a predetermined tolerance range;

(f) creating a supplemental power source power adjustment command based upon the input; and

(g) adjusting the power output of the supplemental power source based on the supplemental power source power adjustment command, thereby driving the error signal to within the predetermined tolerance range.

18. The method of claim 17 wherein the step of establishing a gain comprises establishing a variable gain.

19. The method of claim 17 wherein the step of creating a supplemental power source power adjustment command comprises integrating the input.

20. In a grid-connected application of a microturbine having an adjustable power output up to a predetermined maximum power output and wherein the microturbine supplies power to meet at least a portion of an end-user's power load, a method of maintaining a fixed power offset between the grid and the end-user's power load regardless of the load demanded (up to the sum of the fixed power offset and the microturbine's predetermined maximum power output), the method comprising the steps of:

(a) creating an actual grid power measurement by measuring power flow from the grid to the end-user's power load;

(b) developing an error signal by subtracting the fixed power offset from the actual grid power measurement;

(c) establishing a gain;

(d) creating an input by multiplying the error signal by the gain;

(e) establishing a predetermined tolerance range;

(f) creating a microturbine power adjustment command based upon the input; and

(g) adjusting the power output of the microturbine based on the microturbine power adjustment command, thereby driving the error signal to within the predetermined tolerance range.

21. The method of claim 20 wherein the step of establishing a gain comprises establishing a variable gain.

22. The method of claim 21 wherein the step of establishing a gain comprises establishing a variable gain that is higher for an error signal representing a negative deviation between the actual grid power measurement and the fixed power offset than for positive deviations.

23. The method of claim 20 wherein the step of creating a microturbine power adjustment command comprises integrating the input.

24. The method of claim 20 wherein, in step (e), the predetermined tolerance range is established at least in part based on operating limitations of the microturbine.

25. The method of claim 20 wherein, in step (e), the predetermined tolerance range is established at least in part based on a desired insensitivity to small changes in the end-user's power load.

26. The method of claim 20 wherein the step of creating an actual grid power measurement comprises employing a digital meter.

27. The method of claim 26 wherein the step of creating an actual power grid measurement comprises the digital meter communicating readings to a supervisory control and data acquisition system.

28. The method of claim 27 additionally comprising the step of permitting control personnel to change the fixed power offset and gain by command to the supervisory control and data acquisition system via a World Wide Web browser interface.

29. The method of claim 20 wherein the method results in load transients being absorbed by the grid rather than the microturbine.

30. The method of claim 20 additionally comprising the step of automatically resetting the fixed power offset to zero based on a turbine status bit related to an operating condition of the turbine, wherein the operating condition is chosen from the group that includes turbine speed, turbine inlet temperature, turbine exhaust temperature, fuel flow, and power output.